Amendments to the Drawings:

The drawing sheet attached in connection with the above-identified application containing Figures 2 and 3 is being presented as a new formal drawing sheet to be substituted for the previously submitted drawing sheet. Figure 3 has been amended. Appended to this amendment is an annotated copy of the previous drawing sheet which has been marked to show changes presented in the replacement sheet of the drawing.

The specific changes which have been made to Figure 3 are to add l_1, l_2, l_3, and l_4.

REMARKS

Applicants respectfully request reconsideration of the present application in view of the foregoing amendments and in view of the reasons that follow.

In the specification, paragraphs have been amended on pages 7 and 8.

Claim 3 is cancelled.

Claims 12-15 are being added.

This amendment adds, changes and/or deletes claims in this application. A detailed listing of all claims that are, or were, in the application, irrespective of whether the claim(s) remain under examination in the application, is presented, with an appropriate defined status identifier.

After amending the claims as set forth above, claims 1, 2, and 4-15 are now pending in this application.

Objection to the Drawings

The drawings are objected to for not including reference signs l_1, l_2, l_3, and l_4, as mentioned in the specification. Figure 3 has been amended to add l_1, l_2, l_3, and l_4. Withdrawal of this objection is respectfully requested.

Objection to the Specification

The specification is objected to for containing minor informalities. A new abstract is presented to replace the previously submitted abstract.

The specification has been amended on page 7 to provide the proper value of distance y that satisfies the provided value for the difference in tension between cords.

The specification has been amended on page 8 to provide a corrected formula for calculating a difference in tension between two cords. One of ordinary skill in the art would

recognize that this is the correct formula one would obtain through application of Hooke's Law, which relates stress and strain. Withdrawal of the objection is respectfully requested.

Rejection under 35 U.S.C. § 102

Claims 1 and 2 are rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 4,830,647 (hereafter "Watabe"). This rejection is respectfully traversed as it may be applied against amended claim 1.

Amended claim 1 recites a spool filled with two or more elongated steel elements. Watabe discloses a method of manufacturing glass yarns. Watabe is silent in regard to a spool filled with two or more elongated steel elements. Therefore, Watabe does not disclose all of the features recited by amended claim 1. Withdrawal of this rejection is respectfully requested.

Rejections under 35 U.S.C. § 103

Claims 1 and 3-5 are rejected under 35 U.S.C. § 103(a) as being unpatentable over JP 4-308166 (hereafter "Kondo"). This rejection is respectfully traversed as it may be applied against amended claim 1.

Amended claim 1 recites a spool filled with two or more elongated steel elements wound in parallel and in several windings upon said spool, wherein the distance between two neighboring elongated steel elements, as measured along a line parallel to the axis of the spool, is not more than 10 mm along 90% of the length of each elongated steel element.

Kondo discloses a guide device for a winding machine. The Office refers to Figure 1 and states that "...the distance between two neighboring elongated elements, as measured along a line parallel to the axis of the spool, is not more than 10 mm, as they are touching each other, along 90% of the length of each elongated element." See Office Action at page 4. The Office does not provide a basis for how Kondo, in particular Figure 1, discloses, teaches, or suggests a distance between the two elements over 90% of the length of each element. Claim 1 recites that the distance between two steel elements not be more than 10 mm and that this limit be satisfied along 90% of the length of each steel element. Kondo does not

disclose, teach, or suggest that the distance between the electroconductive wires 16 will not be more than 10 mm and that the distance satisfies this limit be met along 90% of the length of each electroconductive wire 16.

Kondo discloses that the device is used to wind electroconductive wires. The Office states that Kondo is silent in regard to using steel elements but that it would have been obvious to use steel elements. See Office Action at page 4. However, one of ordinary skill in the art would have understood electroconductive wires to mean wires made from materials with low electrical resistivity, such as aluminum alloys and copper alloys, instead of steel, which has a relatively higher electrical resistivity. For example, 1020 carbon steel has an electrical resistivity of about 10 $\mu\Omega\cdot$cm, while aluminum alloy 3003 has an electrical resistivity of about 4 $\mu\Omega\cdot$cm and copper alloys (such as ASTM B152, B124, B133, B1, B2, and B3) have electrical resistivities of about 1.7 $\mu\Omega\cdot$cm. Attached to the reply is a copy of a table listing miscellaneous property for various commercial metals and alloys from the CRC Handbook of Chemistry and Physics, 54th Edition, CRC Press, p. D-150, 1973.

Further, aluminum alloys and copper alloys have different values for modulus than steel. This is important, because as shown in the formula on page 8, materials with a higher value for modulus (E) have greater differences in tension between elements, increasing the likelihood of sagging. Aluminum alloys and copper alloys have lower modulus values than steel. For example, 1020 carbon steel has a modulus of about 200,000 MPa, while aluminum alloy 3003 has a modulus of about 70,000 MPa and copper alloys (such as ASTM B152, B124, B133, B1, B2, and B3) have modulus values of about 120,000 MPa. Because aluminum alloys and copper alloys have significantly lower modulus values than steel, electroconductive wires 16 made of aluminum alloys or copper alloys would not have the differences in tension that steel elements would and would not experience the same problems with sagging. Therefore, it would not have been obvious to one of ordinary skill in the art to use steel elements in Kondo's process because Kondo does not address differences in tension between steel elements and problems caused by such differences in tension, such as sagging. For at least these reasons, withdrawal of the rejection of claims 1 and 3-5 is respectfully requested.

Claim 7 is rejected under 35 U.S.C. § 103(a) as being unpatentable over Watabe. This rejection is respectfully traversed as it may be applied against amended claim 7. As noted above, Watabe does not disclose or suggest steel elements. Watabe provides no disclosure, teaching, or suggestion to provide a spool wound with steel elements instead of glass elements. Nor does Watabe provide one of ordinary skill in the art a motivation for providing steel elements instead of glass elements.

Applicants further note that glass is materially different from steel. For example, drawing molten glass through orifices to manufacture glass yarns, as disclosed by Watabe, will not have the same concerns regarding tension as winding steel elements. Steel elements are solid elements with a substantial modulus (E) value. A molten glass yarn has a much lower modulus value due to its molten state, allowing the glass to elongate much more readily. Any differences in tension between molten glass strands will be absorbed by the glass material itself, minimizing the difference in tension between strands and any potential sagging of strands. Because Watabe's process uses glass, this process does not suffer from the same concerns as processes using steel elements. Therefore, it would not have been obvious to one of ordinary skill in the art to use steel elements in Watabe's process because Watabe does not address differences in tension between elements and problems caused by such differences in tension, such as sagging. For at least these reasons, withdrawal of the rejection of claim 7 is respectfully requested.

Claims 8-11 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Watabe as applied to claim 7 above, and further in view of U.S. Patent No. 2,187,841 (hereafter "Pierce"). Pierce does not remedy the deficiencies of Watabe. For example, Pierce does not disclose substituting glass elements with steel elements. Nor does Pierce provide a motivation for one of ordinary skill to undertake such a modification. For at least these reasons, withdrawal of this rejection is respectfully requested.

Allowable Subject Matter

Applicants wish to thank the Office for indicating that claim 6 contains allowable subject matter. Applicants note that new claim 12 contains language similar to claim 6.

Applicants believe that the present application is now in condition for allowance. Favorable reconsideration of the application as amended is respectfully requested.

The Examiner is invited to contact the undersigned by telephone if it is felt that a telephone interview would advance the prosecution of the present application.

The Commissioner is hereby authorized to charge any additional fees which may be required regarding this application under 37 C.F.R. §§ 1.16-1.17, or credit any overpayment, to Deposit Account No. 19-0741. Should no proper payment be enclosed herewith, as by a check being in the wrong amount, unsigned, post-dated, otherwise improper or informal or even entirely missing, the Commissioner is authorized to charge the unpaid amount to Deposit Account No. 19-0741. If any extensions of time are needed for timely acceptance of papers submitted herewith, Applicant hereby petitions for such extension under 37 C.F.R. §1.136 and authorizes payment of any such extensions fees to Deposit Account No. 19-0741.

Respectfully submitted,

Date 2/3/2006

By

Glenn Law
Attorney for Applicant
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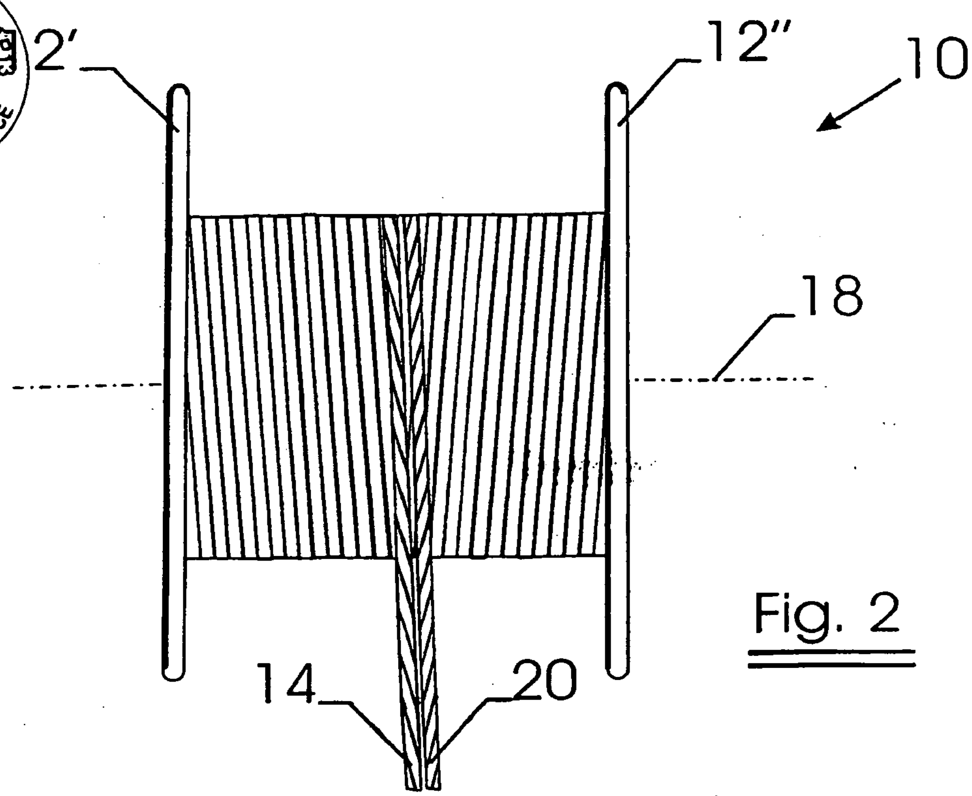
COMMERCIAL METALS AND ALLOYS

Miscellaneous Properties

Properties (Typical Only)

Common name and classification	Thermal conductivity, Btu/hr ft°F	Thermal conductivity, Kcal/sec m °C	Specific gravity	Coeff. of linear expansion, μ in./in.-°F	Electrical resistivity, microhm-cm	Modulus of elasticity, millions of psi	Approximate melting point, °F	Approximate melting point, °C
Ingot iron (included for comparison)	42	0.32	7.86	6.8	9	30	2800	1538
Plain carbon steel AISI–SAE 1020	30	0.23	7.86	6.7	10	30	2760	1515
Stainless steel type 304	10	0.08	8.02	9.6	72	28	2600	1427
Cast gray iron ASTM A48–48, Class 25	26	0.20	7.2	6.7	67	13	2150	1177
Malleable iron ASTM A47			7.32	6.6	30	25	2250	1232
Ductile cast iron ASTM A339, A395	19	0.14	7.2	7.5	60	25	2100	1149
Ni-resist cast iron, type 2	23	0.17	7.3	9.6	170	15.6	2250	1232
Cast 28-7 alloy (IID) ASTM A297–63T	1.5	0.01	7.6	9.2	41	27	2700	1482
Hastelloy C	5	0.04	3.94	6.3	139	30	2350	1288
Inconel X, annealed	9	0.07	8.25	6.7	122	31	2550	1399
Haynes Stellite alloy 25 (L605)	5.5	0.04	9.15	7.61	88	34	2500	1371
Aluminum alloy 3003, rolled ASTM B221	90	0.68	2.73	12.9	4	10	1200	649
Aluminum alloy 2017, annealed ASTM B221	95	0.72	2.8	12.7	4	10.5	1185	641
Aluminum alloy 380 ASTM SC84B	56	0.42	2.7	11.6	7.5	10.3	1050	566
Copper ASTM B152, B124, B133, B1, B2, B3	225	1.70	8.91	9.3	1.7	17	1980	1082
Yellow brass (high brass) ASTM B36, B134, B135	69	0.52	8.47	10.5	7	15	1710	932
Aluminum bronze ASTM B169, alloy A; ASTM B124, B150	41	0.31	7.8	9.2	12	17	1900	1038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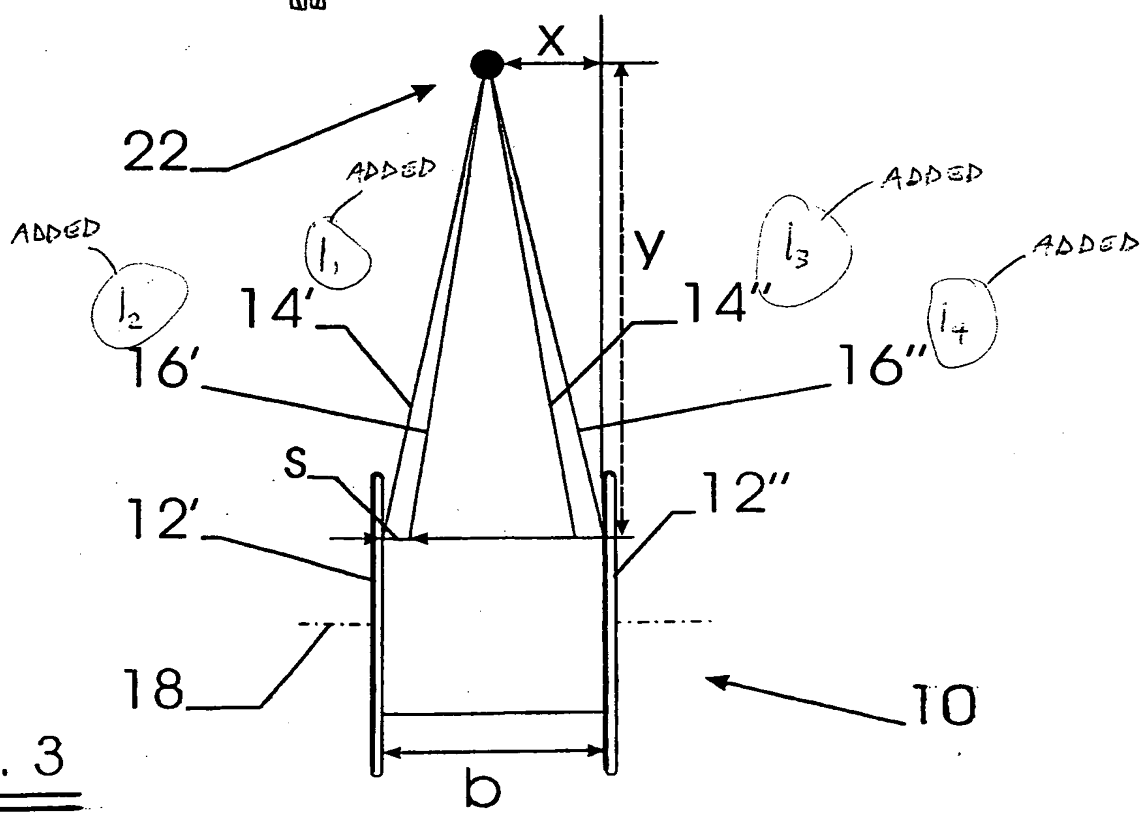
20

Fig. 2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22
y
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b

Fig. 3